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NOMENCLATURAL AND TAXONOMIC ANALYSIS OF *CONVALLARIA MAJALIS*, *C. MAJUSCULA*, AND *C. MONTANA* (RUSCACEAE/LILIACEAE)

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ABSTRACT

Convallaria montana Raf. is shown to be a superfluous name for *C. pseudomajalis* Bartr., which was likely based on a specimen of *Polygonatum*, so that the earliest available name for the American lily-of-the-valley is *C. majuscula* Greene. Two new combinations proposed: **C. majalis** L. subsp. **majuscula** (Greene) Gandhi, Reveal, and Zarucchi and **C. majalis** var. **majuscula** (Greene) Gandhi, Reveal, and Zarucchi. A neotype is chosen for *Convallaria majuscula* Greene.
KEY WORDS: Nomenclature, eastern North America, *Convallaria majalis* subsp. *majuscula*, *Convallaria pseudomajalis*, lily-of-the-valley

The American lily-of-the-valley has been known under the following names: *Convallaria majalis* L. (Michaux 1803: 201; Pursh 1813: 232; Nuttall 1818: 224; Elliott 1817: 396; Britton & Brown 1896: 434; Small 1933: 301; Gleason & Cronquist 1991: 839), *C. montana* Raf. (Fernald 1944: 14), *C. majuscula* Greene (USDA, NRCS 2012), "C. majalis var. montana (Raf.) H.E. Ahles" (Utech 2002: 206), and *C. majalis* var. *montana* H.E. Ahles (USDA, ARS, National Genetic Resources Program, 2012). The known range of this taxon is confined mainly to the Appalachian Mountains of the eastern United States in northern Georgia, southeastern Kentucky, western North Carolina, northwestern South Carolina, eastern Tennessee, western Virginia, and West Virginia.

Typical *Convallaria majalis* is a native of Europe. Among those who applied this name to the American plants, it was Small (1933) who distinguished the American plants from their European counterparts as follows: "The native American plant usually has a shorter inflorescence, and has larger bracts and an oblate seed." In contrast, Gleason and Cronquist (1991) were of the opinion that the "seemingly native" plants are "casually escaped plants" and "may reflect an early escape of a different phase of sp. [*C. majalis*] in cult[ivation]." Others, such as Michaux (1803) and Pursh (1813), did not comment on the nativity of the American plants.

During a comparative study of the specimens of *Convallaria majalis* and *C. majuscula*, we discovered a nomenclatural problem that was previously overlooked.

William Bartram (1810), who was the first to distinguish the American native taxon from the European taxon, assigned to it the name *Convallaria pseudomajalis* and remarked: "It differs but little from *C. majalis* of Europe, only is larger every way, and the fruit blue more oblong to ovate." Although Rafinesque (1840: 66) was aware of Bartram's name, he proposed the name *Convallaria montana* for the American plants and at the same time cited *C. pseudomajalis* as a synonym. Thus, *C. montana* was superfluous and illegitimate when published, and it is automatically typified on the type of *C. pseudomajalis*. Within his treatment, Rafinesque mentioned that according to Bartram, "the berries are blue and ovate." Rafinesque characterized his *C. montana*, after a Latin description, where he mentioned "fol. binis sessilib. ovatobl. acum." and "racemo 10-12floris, bract. lanc. ad ped. eq. fl. secundis" as a "large plant, leaves 6 to 8 inches long, 2 wide, fl. size of C. majalis." He contrasted *C. majalis* with "leaves petiolate elliptic acute" (size not given) and "raceme of 7–8 fl. bracts half the length of the pedicels."

Greene (1908: 46), without a reference to Bartram or Rafinesque, proposed *Convallaria majuscula*. He characterized his species as with "very large light-green leaves without trace of bloom, with excessively fibrous anatomy, insomuch that the surface of the leaf when growing looks to be plicate rather than plane and even."

Fernald (1944: 12–14) emphasized the nativity of the American plants. He treated *Convallaria montana* and *C. majuscula* as conspecific. Based on the priority, he accepted *C. montana* and cited *C. majuscula* as its synonym. Based on Bartram's description of the fruits as blue, Fernald speculated that that "Bartram could quite as well have had *Polygonatum!*" For this reason, he excluded *C. pseudomajalis* (the illegitimacy-causing synonym) from *C. montana*, and thus he inadvertently created "*C. montana* Fernald" as a later homonym (Vienna Code Art. 48.1 applies; McNeill et al. 2006). Ahles (1964: 172), seemingly unaware of the illegitimacy of *C. montana* Raf., transferred it to *C. majalis* at the rank of a variety and thus effectively created a *nomen novum* for the Rafinesque name. Since he did not exclude Bartram's *C. pseudomajalis* from his var. *montana*, the varietal name is automatically typified by the type of Bartram's species.

In our study, we looked for the earliest collection records of the Appalachian native plants. Because it was included in Pursh's treatment ("On the highest mountains of Virginia and Carolina"), it is evident that it was collected before 1813. We located the following pre-1900 collections: (1) 1838: S.B. Buckley (MO, NY, US); (2) 1839: J. Reinhart (GH) and J. Torrey (GH); (3) 1841: A. Gray & J. Carey (GH); (4) 1871: A.H. Curtiss (NY); (5) 1873: A.H. Curtiss (GH, MO, NDG, NY); (6) 1874: A.H. Curtiss (US); (7): 1878: H. Shriver (NY); (8) 1890: W.M. Canby (GH, MO, NY) and A. Brown et al. (NY); and (9) 1892: N.L. Britton et al. (NY) and J.K. Small (MO). None of the specimens was annotated by Greene.

We also found that most of the traditional, distinguishing characters between the American and European plants overlap, such as leaf size and number of flowers per raceme. Nevertheless, the bract/pedicel length ratio and flowering raceme/leaf blade length ratio appear to be informative. Furthermore, cultivated populations of *Convallaria majalis* and the native populations of *C. majuscula* are allopatric. Accordingly, we follow Ahles (1964) and Utech (2002) in treating the American plants at the infraspecific rank.

1. Plants forming dense colonies; leaves green until frost, veins faint; raceme (excluding scape) about half the length of the leaves; bracts 4-10 mm long, shorter than the pedicels; seeds almost globose ..... subsp. *majalis*
1. Plants scattered or forming small groups; leaves yellowing in late summer, veins strong; raceme (excluding scape) much shorter than the leaves; bracts 8-20 mm long, usually as long or longer than pedicels; seeds oblate or lenticular ..... subsp. *majuscula*

Typification

Since no known type exists for *Convallaria majuscula*, the name needs to be neotypified. We found that the GH, NDG, and NY specimens of the A.H. Curtiss collection made in 1873 bear a 1966 annotation by H.H. Iltis as "neotype." Two specimens (MO) of this collection do not have Iltis's annotation, and to the best of our knowledge, Iltis did not publish his designation. We communicated with Iltis asking for any information on his neotype designation but did not receive any response. Therefore, we opt to neotypify *C. majuscula* here.

Convallaria majalis L. subsp. ***majuscula*** (Greene) Gandhi, Reveal, and Zarucchi [comb. et stat. nov.] var. ***majuscula*** (Greene) Gandhi, Reveal, and Zarucchi [comb. et stat. nov.]. Basionym: *Convallaria majuscula* Greene, Repert. Spec. Nov. Regni Veg. 5: 46. 1908. **NEOTYPE** (designated here): **USA. Virginia**. Bedford Co.: Peaks of Otter, alt. 3500 ft, 2 Jun 1873, *A.H. Curtiss s.n.* (GH; isoneotypes: MO-2 sheets, NDG, NY).

Synonyms: *C. montana* Fernald, Rhodora 46: 14. 1944, nom. illeg., non Raf. 1840; *C. montana* sensu Raf., Aut. Bot. 1(Cent. V): 66. 1840, p.p., excluding the reference to *C. pseudomajalis*; *C. majalis* var. *montana* sensu H.E. Ahles, J. Elisha Mitchell Sci. Soc. 80: 172. 1964, p.p., excluding the type.

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